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TRANSLATION

INSIDE-SHOE DRUM BRAKE FOR MOTOR VEHICLES

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INSIDE-SHOE DRUM BRAKE FOR MOTOR VEHICLES

[Innenbacken-Trommelbremse für Kraftfahrzeuge]

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Applicant: Volkswagen AG

The invention relates to an inside-shoe drum brake for motor vehicles of the type mentioned in the preamble of Claim 1, as known, e.g., from DE-OS 21 65 733 or DE-PS 26 44 575.

As is known, braking a motor vehicle often causes the brakes to produce very unpleasant squealing.

There has not been a lack of attempts to solve this squealing by very different and also more or less complex structural means. For example, it is known in disk brakes to provide every part of the brake that can move against another part with a layer made from plastic adhesive on its surface pointing outwards outside of the friction pair and the guidance grooves of the floating caliper (e.g., DE-OS 23 35 595) or else to surround just the floating caliper or frame on all sides with a 5-10 mm thick coating made from a coating material with a relatively high material-loss

factor (e.g., DE-OS 26 03 795). It is also known (e.g., DE-OS 22 11 857) to embody the floating frame of a disk brake with a sandwich configuration, i.e., to adhere the floating frame, which is typically made from sheet metal, with a sheet metal similar to it in shape.

In inside-shoe drum brakes, to prevent brake squealing it is known to not let the inner side surfaces of the brake shoes directly touch the brake anchor metal plate, but instead to place in-between special contact plates (DE-PS 11 03 160) or small bearing blocks or the like (US-PS 3,177,978, US-PS 3,220,515) made from materials with good sliding properties.

With this background in mind, the invention is based on the task of forming an inside-shoe drum brake for motor vehicles of the type mentioned in the preamble of Claim 1, such that when the brake is activated, no braking noises or at most only slightly disruptive braking noises are generated.

This task is achieved according to the invention by the features of Claim 1.

Advantageous configurations and improvements of the invention are given in the subordinate claims.

According to the invention, the brake anchor metal plate, which is usually formed in one piece, for the brake disk is assembled from at least two sheet-metal parts of different material thickness, with an inner first sheet-metal part that can be mounted on the wheel support and that has a larger material thickness and an outer second sheet-metal part of smaller material thickness, which supports a typical circular collar along its outer periphery pointing in the direction of the brake drum, with support elements, e.g., in the form of a bearing block or the like, preferably being mounted on the first sheet-metal part, which is thicker in terms of material, for the circumferential forces of the brake shoes.

The invention will be explained in more detail in the following with reference to two embodiments illustrated by in the drawings.

Shown in the drawings are:

Figure 1, an inside-shoe drum brake according to the invention with removed brake drum,

Figure 2, the front view of the brake anchor metal plate of a first embodiment of such a drum brake,

Figure 3, a section of this brake anchor metal plate along the section guide III in Figure 2,

Figure 4, the front view of a brake anchor metal plate of a second embodiment of the drum brake according to the invention, and

Figure 5, a section through this brake anchor metal plate along the section guide V in Figure 4.

The inside-shoe drum brake 1 for motor vehicles shown in Figure 1 contains, as usual, a brake anchor metal plate 2 that can be mounted on a wheel support of the vehicle, which is not shown in more detail, and also two brake shoes 7, which are supported on the anchor plate and

which are supported in the embodiment with their bottom ends on a bearing block-like support element 8 mounted on the brake anchor metal plate and which are each pressed against the wall of the brake drum not shown here by corresponding activation elements 9 acting on the upper end of the corresponding brake shoe in the form of hydraulic wheel brake cylinders. The two brake shoes are held in contact with the brake anchor metal plate 2 conventionally by hold-down springs 15 acting on their brake-shoe connecting pieces 10. Along the outer periphery, the brake anchor metal plate 2 supports a circular collar 3, which points in the direction of the removed brake drum and which, together with a corresponding formation of the brake drum edge, essentially contributes to preventing the penetration of contaminants and sprayed water or the like into the interior of the drum brake.

The brake anchor metal plate 2 is not formed in one piece as generally typical, but instead it is assembled from two sheet-metal parts of different material thickness. An inner, first sheet-metal part 4 of greater thickness has several holes 16 arranged in a circle for mounting the brake anchor metal plate 2 on the wheel support, which is not shown further. An outer, second sheet-metal part 5, which has the circular collar 3 and which is undetachably connected to the inner, first sheet-metal part 4, e.g., by spot welding or the like, is produced from a steel metal sheet of smaller material thickness. The bearing block-like support elements 8 supporting the two brake shoes for activating the brake in the circumferential direction are here mounted on the thicker, inner second sheet-metal part 4. Both sheet-metal parts 4 are formed in a known way as drawn sheet-metal parts, so that the circular collar 3 is formed on the outer second sheet-metal part 5, among other things, in addition to other sections pressed inwards and outwards, which are not shown in more detail, and an indentation 12, which points in the direction of the brake drum and which is part of the support element for the brake shoes 7, is formed in the bottom region of the thicker first sheet-metal part 4.

In contrast, the activation element 9 for the brake shoes 7, i.e., the hydraulic wheel-brake cylinder, is held on the thinner outer second sheet-metal part 5, diametrically opposite to the activation element 8, wherein this is also provided with a plateau-like indentation 11, which points in the direction of the brake drum and on which the activation element 9 is screwed.

Through the decoupling of the force introduction created with the mounting of the support element 8 on the thicker first sheet-metal part 4 and the activation element 9 on the thinner second sheet-metal part 5, the reduction of the braking squealing already created by the division into two parts and by the different material thickness of the brake anchor metal plate 2 is further improved.

The two sheet-metal parts 4, 5 are cut relative to each other such that the axial support or guidance of the two brake shoes 7 occurs essentially on the thinner second sheet-metal part 5. This also contributes to reducing brake squealing.

In the first embodiment of the inside-shoe drum brake according to the invention shown in Figures 2 and 3, the two brake shoes are each supported conventionally with the inner side surfaces

of their brake backs each on three raised, limited contact surfaces, which can be formed by small plates or the like made from a similar material and mounted on the brake anchor metal plate in an advantageous way. These small plates can be realized, e.g., in the form of brass rivets or in the form of inserted plastic stoppers. In Figure 2, corresponding holes for drawing in the rivets or inserting the stoppers are designated with 13.

However, an even more effective reduction of the brake squealing is produced when the axial support or guidance of the brake shoes 7 is realized by means of the brake shoe connecting pieces 10 of the brake shoes 7 running at least approximately parallel to the brake anchor metal plate plane, each in their center regions and preferably not only point-by-point, but also along a certain part of the connecting piece length.

In the second embodiment shown in Figures 4 and 5, the brake anchor metal plate 2, i.e., the thinner, outer second sheet-metal part 5 of the brake anchor metal plate, is formed accordingly. It has two at least approximately diametrically opposed, curved, elongated support regions 6, which extend axially in the direction of the brake drum and on which the brake shoe connecting pieces 10 of the two brake shoes 7 can be supported in the axial direction. It is understood that the lever 17 provided in Figure 1 for activating the parking brake (hand brake) must be adapted accordingly in its outer shape for such a design.

It is advantageous when the support regions 6 for the brake shoe connecting pieces 10 of the two brake shoes are provided with a low-friction coating. It is also conceivable to not press the support regions 6 formed in the second sheet-metal part 5 as far in the direction of the brake drum and instead to clip on or in a correspondingly thick intermediate piece made from a plastic or the like with good sliding properties.

In the front views of the brake anchor metal plate shown in Figures 2 and 4, the outer contours of the inner, thicker first sheet-metal part 4 are shown with dashed lines and the inner contours of the thinner, outer second sheet-metal part 5 are shown with a thick continuous line. In the overlapping region, the two sheet-metal parts are connected to each other, e.g., by spot welding. As the two Figures 2 and 4 show, the two sheet-metal parts 4, 5 are each formed essentially mirror-symmetric to a first axis A and asymmetric to a second axis B perpendicular to the first axis. It can also be advantageous to arrange beads or the like imprinted for reinforcing the outer, thinner second sheet-metal part also asymmetric to each other. It should be added that holes for holding the hold-down spring 15 shown in Figure 2 are designated with 14 in Figures 2 and 4.

Claims

1. Inside-shoe drum brake (1) for motor vehicles with a brake anchor metal plate (2) that can be mounted on the wheel support of the vehicle with a collar (3), which extends along its outer periphery and which points in the direction of the brake drum, with brake shoes (7), which are

supported on the brake anchor metal plate (2) and which can be pressed against the brake drum, and also with support elements (8) mounted on the brake anchor metal plate (2) and/or activation elements (9) for the brake shoes (7), characterized in that the brake anchor metal plate (2) is assembled from at least two sheet-metal parts (4, 5) of different material thickness, namely from an inner first sheet-metal part (4) of greater material thickness that can be mounted on the wheel support and an outer second sheet-metal part (5) of smaller material thickness containing the circular collar (3), with support elements (8) for the circumferential forces of the brake shoes (7) being mounted preferably on the first sheet-metal part (4).

2. Inside-shoe drum brake according to Claim 1, characterized in that the activation elements (9) for the brake shoes (7) are mounted on the second sheet-metal part (5).

3. Inside-shoe drum brake according to Claim 1 or 2, characterized in that the axial support or guidance of the brake shoes (7) is realized on the second sheet-metal part (5).

4. Inside-shoe drum brake according to Claim 3, characterized in that the axial support or guidance of the brake shoes (7) is realized via the brake shoe connecting pieces (10) extending at least approximately parallel to the brake anchor metal plate plane, each in their center regions.

5. Inside-shoe drum brake according to Claim 4, characterized in that in the second sheet-metal part (5), two support regions (6), which are at least approximately diametrically opposite each other and which project in the direction of the brake drum and which extend along one part of the connecting piece length, are formed for the brake shoe connecting piece (10).

6. Inside-shoe drum brake according to Claim 5, characterized in that the support regions (6) of the second sheet-metal part (5) are provided with a low-friction coating.

7. Inside-shoe drum brake according to one of Claims 1-6, characterized in that the two sheet-metal parts (4, 5) are formed in a known way as sheet-metal drawn parts.

8. Inside-shoe drum brake according to one of Claims 1-7, characterized in that the two sheet-metal parts (4, 5) are each formed mirror symmetric to a first axis (A) and asymmetric to a second axis (B) perpendicular to the first axis.

9. Inside-shoe drum brake according to one of Claims 1-8, characterized in that the second sheet-metal part (5) has reinforcement beads formed and/or arranged asymmetrically.

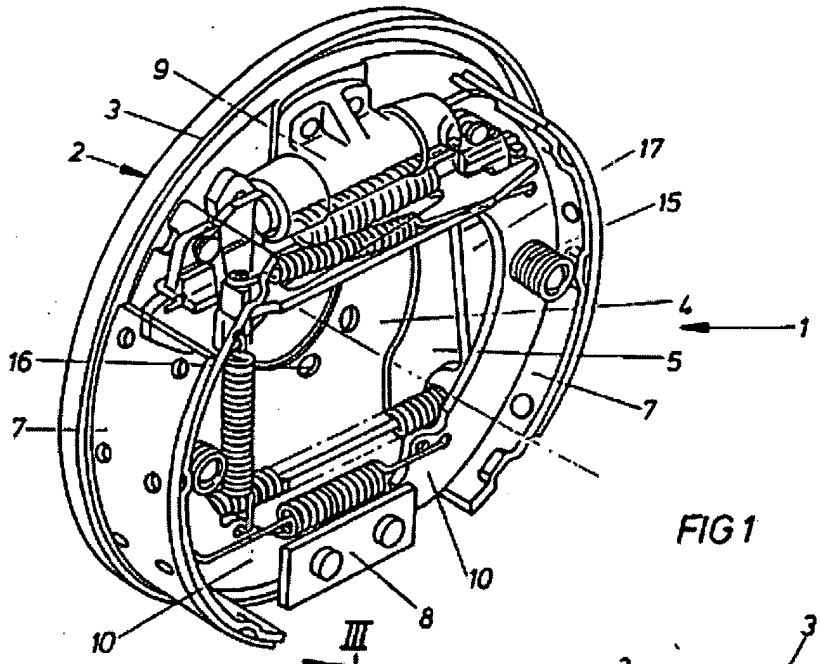

FIG 1

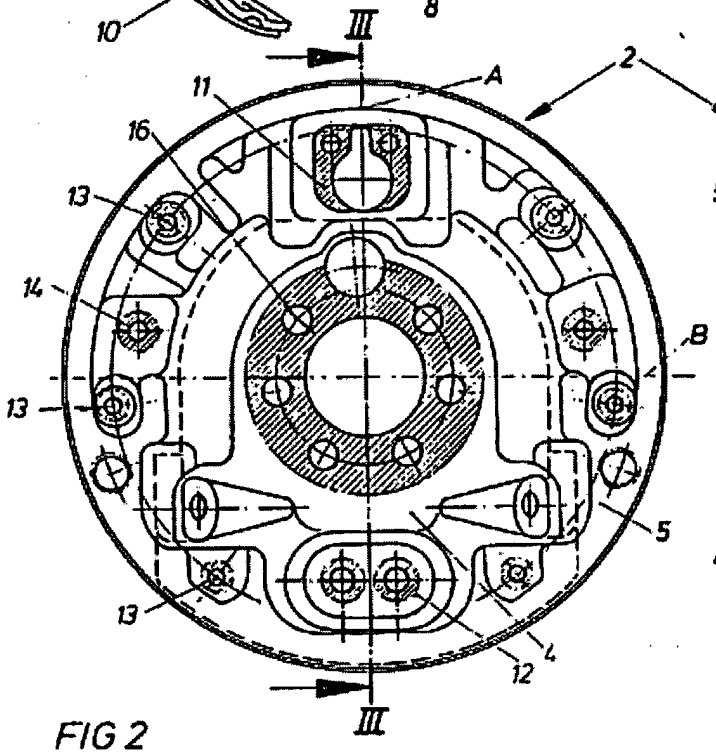

FIG 2

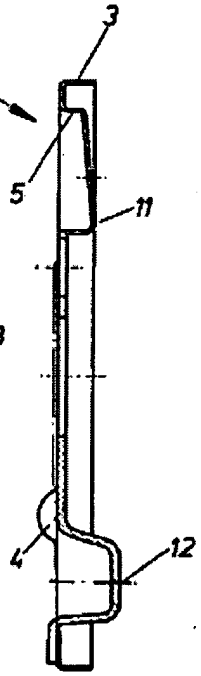

FIG 3

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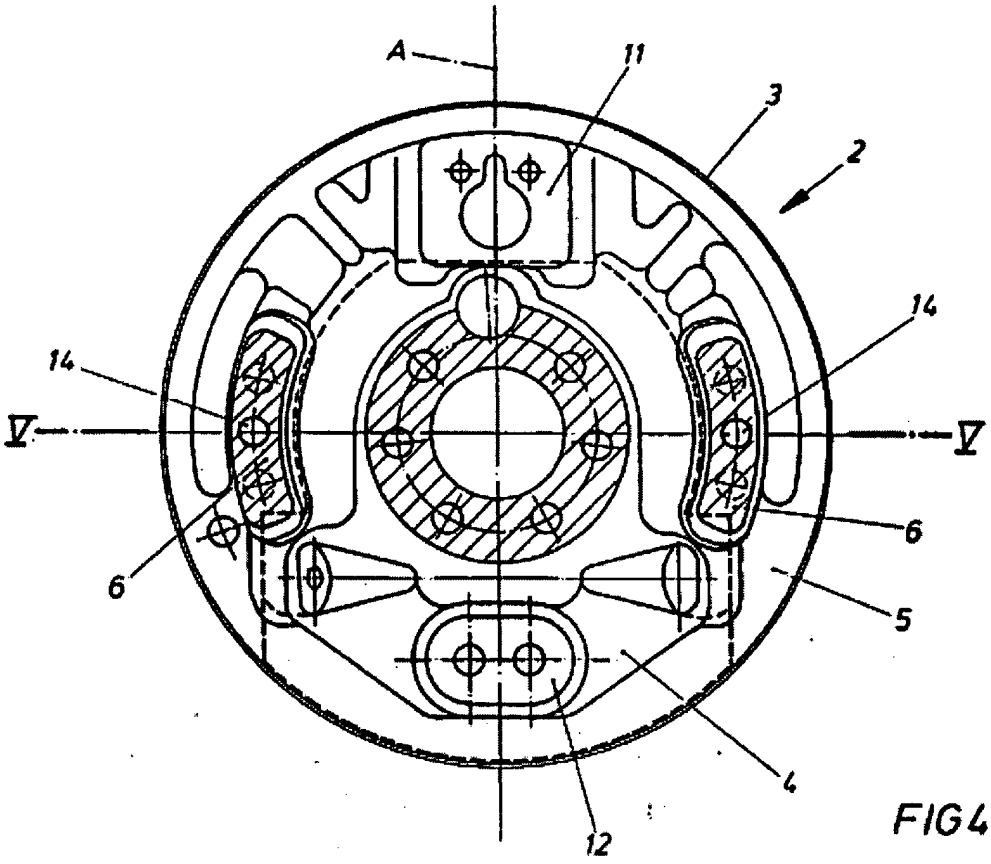

FIG 4

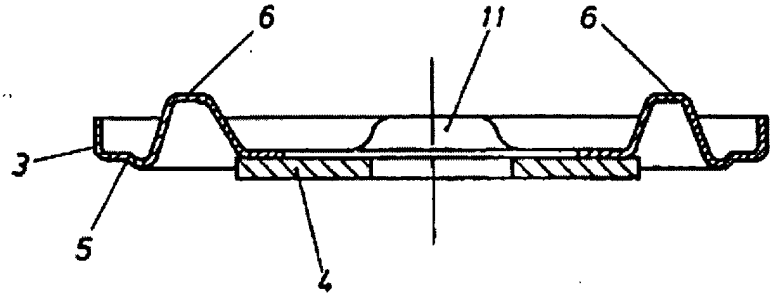

FIG 5